

PHOENIX FIRE CODE, ARTICLE 9

Add the following to Article 1:

105.7, Item f.9. Fire apparatus access roads, interior. For a permit to install or modify an “interior fire apparatus access road,” see Article 9.

105.7, Item f.10. Address directory. For a permit to install or modify an address directory, see Article 9.

The above new permits to be added to Appendix B (Fees).

- R1001.9 will be repealed before these changes take into effect because the info in that regulation conflicts with that proposed here for hillside lots.

ARTICLE 9 - FIRE DEPARTMENT ACCESS AND WATER SUPPLY

SECTION 901 – GENERAL

901.1 Scope. Fire department access and water supply shall be in accordance with Article 9. For fire safety during construction, alteration or demolition of a building, see Article 87.

901.2 Definitions, Limited application. For the purpose of Article 9, certain terms are defined as follows:

ADDRESS DIRECTORIES are graphic displays of dwelling unit or business suite locations that are weather resistant, internally illuminated and permanently mounted adjacent to the fire department access road.

ALTERNATIVE SURFACE ACCESS ROADS are fire apparatus access roads for fire department use, that are required for fire department access, and that are constructed with approved materials, other than pavement.

AUXILIARY ACCESS OPENINGS are gated vehicle entrance and exit locations other than a property’s primary or main entrance.

FIRE APPARATUS ACCESS GATES are automatic or manually operated gates or devices provided for fire apparatus access into or from a property, including auxiliary access openings.

FIRE APPARATUS ACCESS ROADS are roads shared by emergency and private vehicles to allow access throughout a property and includes alternative surface access roads and interior fire apparatus access roads.

FIRE FLOW is the flow rate of a water supply, measured at 20 psi residual pressure, that is available for firefighting.

FIREFIGHTER ACCESS WALKWAY is an approved pedestrian path used for fire department personnel access from a fire apparatus road to the building or property.

INTERIOR FIRE APPARATUS ACCESS ROADS are fire apparatus access roads dedicated

to fire department use and are required by the fire code to provide interior property access to the building. Roads may be constructed of pavement or other approved materials.

PEDESTRIAN GATES are gates required by the Building Code to provide egress to a public right-of-way or gates that are required by the Fire Code to provide fire fighter emergency access.

PREEMPTION DEVICE is a listed and approved electronic device that receives a signal compatible with transmitters on emergency vehicles and that is used to automatically open and close fire apparatus access gates.

SPREAD NUMBERS are a means of building identification that are a numerical indication of the dwelling units found on each floor of each multifamily residential building.

901.3 Permits, Plans, Fees and Inspections. Permits are required to be obtained from the Fire Department in accordance with this section. Additional permits may be required by the Building Official.

901.3.1 Permits.

901.3.1.1 Permits for private underground fire lines and hydrants. Permits are required to be obtained from the Fire Department to install or modify private underground fire lines and hydrants. See Article 10 and Section 105, permit f.7.

901.3.1.2 Permits for fire apparatus access gates. Permits are required to be obtained from the Fire Department to install or modify both manual and automatic fire apparatus access gates and their appurtenances. This also includes gates for auxiliary access openings. See Section 105, permit a.6.

901.3.1.3 Permits for alternative surface access roads. Permits are required to be obtained from the Fire Department to install or modify alternative surface access roads. See Section 105, permit f.8.

901.3.1.4 Permits for interior fire apparatus access roads. Permits are required to be obtained from the Fire Department to install or modify interior fire apparatus roads. See Section 105, permit f.9.

901.3.1.5 Permits for address directories. Permits are required to be obtained from the Fire Department to install or modify address directories. See Section 105, permit f.10.

901.3.1.6 Permits to use fire hydrants. Unauthorized use of water from fire hydrants connected to the city water system is theft. Permits to use public fire hydrants are required to be obtained from the Water Department. The use of public or private fire hydrants, except for use necessary for firefighting and maintenance of the water supply system, is not allowed unless the flow is metered at the point of connection to the city system or a use permit has been obtained from the Water Department. Adequate means to prevent backflow shall be provided.

EXCEPTION: A permit is not required for persons employed or authorized by the water purveyor that operates the system.

901.3.1.7 Operation of valves that control fire protection systems. Public valves controlling water supplies to fire protection systems shall only be operated by Water Department employees or their authorized representatives. A permit from the Fire Department is not required. The management of the operation of private valves controlling water supplies is the responsibility of the property owner, see section 1001.5. Valves are to remain fully open at all times, except as required for maintenance, repair or modification to the system. In all cases where privately owned valves must be closed, the Fire Department shall be notified and the owner or their authorized representative shall take steps to assure that the valve is reopened and the system is returned to service as soon as possible after maintenance, repair or modification is complete.

901.3.1.8 Tampering With Gate Equipment and Fire Lane Signs. Apparatus, equipment, key switches, preemption devices, and other appurtenances belonging to or under the supervision and control of the fire department shall not be molested, tampered with, damaged or otherwise disturbed unless authorized by the Fire Department.

901.3.2 Plans.

901.3.2.1 Fire apparatus access roads. Plans for fire apparatus access roads, including interior and alternative surface apparatus access roads, shall be submitted to the Fire Department for review and approval prior to construction. See Section 902 for fire apparatus access road requirements. For additional guidance on fire apparatus access road design, see "PFD Emergency Access Guidelines".

901.3.2.2 Water supply systems for fire protection. Plans and specifications for private water supply systems for fire protection shall be submitted to the Fire Department for review and approval prior to construction. See Section 903 for requirements regarding water supply systems for fire protection.

901.3.2.3 Address directories. Prior to construction or installation of an address directory, plans shall be submitted to the Fire Department for approval. See Section 904.1.5 for address directory requirements. Plans may also be required to be submitted to the Development Services Department for approval.

901.3.2.4 Fire apparatus access gates. Plans shall be submitted to the Fire Department for approval prior to the installation or modification of fire apparatus access gates. This includes both automatic and manual access gates. See Section 905 for fire apparatus access gate requirements. Plans for fire apparatus access gates shall also be submitted to the Development Services Department for approval.

901.3.2.5 Pedestrian gates. Plans for pedestrian gates shall be submitted to the Development Services Department for review and approval. See also Section 906.2.

901.3.3 Fees.

901.3.3.1 Plans. Fees for plan review shall be paid at the time of plan submittal. See Appendix B for the fee schedule.

901.3.3.2 Key boxes and switches. Fees for key boxes and switches shall be submitted at time of purchase. See Appendix B for the fee schedule.

901.3.4 Inspections

901.3.4.1 Inspection of private water supply systems. Private water supply system installations and modifications shall be subject to field inspection and tests by the Fire Department.

901.3.4.2 Inspection of fire apparatus access roads. Fire apparatus access roads shall be subject to field inspection and may be subject to testing using fire apparatus. The owner is responsible for any repairs necessary due to the inadequate design of the access road.

901.3.4.3 Inspection of Gates. Fire apparatus access gates and any gates used for fire department personnel access shall be subject to field inspection and may be tested using fire apparatus.

901.4 Timing of Installation. When fire apparatus access roads and water supplies for fire protection are required, such protection shall be installed, made serviceable and maintained prior to bringing combustible materials onto the site and during the time of construction.

901.5 Required Marking of Fire Apparatus Access Roads, Fire Apparatus Access Gates, Addresses and Fire-protection Equipment.

901.5.1 Fire Apparatus Access Roads. Marking of fire apparatus access roads shall be in accordance with Section 902.4.

901.5.2 Fire Apparatus Access Gates. Marking of fire apparatus access gates shall be in accordance with Section 905.

901.5.3 Addresses and Address Directories. Addresses and address directories shall be in accordance with Section 904.

901.5.4 Fire protection equipment and fire hydrants. Fire protection equipment and fire hydrants shall be clearly identified in an approved manner to make them easily identifiable and prevent obstruction. When required by the Fire Department, hydrant locations shall be identified by the installation of reflective markers. See also Section 1001.8.

901.6 Obstruction and Control of Fire Apparatus Access Roads and Fire-protection Equipment. See Sections 902.5 and 1001.7.

901.7 Fire Protection in Recreational Vehicle, Mobile Home and Manufactured Housing Parks, Sales Lots and Storage Lots. Recreational vehicle, mobile home and manufactured housing parks sales lots and storage lots shall provide and maintain fire hydrants and access roads in accordance with Article 9.

SECTION 902 - FIRE DEPARTMENT ACCESS

902.1 General. Fire apparatus access roads shall be provided and maintained in accordance with Sections 901 and 902.

902.2 Required access. The distance from a fire apparatus access road to any point in a building shall not exceed that specified in Section 902.2. In addition, special access requirements are contained in other sections of this code as follows:

1. for personnel access to buildings, see Section 906.
2. for high-piled storage, see Section 8102.6.1
3. for access during construction, alteration or demolition of a building, see Section 8704.2

902.2.1 Non-sprinklered Buildings. In a building without a sprinkler system or in a building with a partial sprinkler system, the maximum distance from a fire apparatus access road to any point in the building shall not exceed 200 feet.

902.2.2 Sprinklered buildings. In buildings protected throughout by a sprinkler system installed in accordance with NFPA 13, the maximum travel distance from a fire apparatus access roads to any point in the building shall not exceed 300 feet.

Group R-3 Occupancies less than 5000 square feet and protected by a sprinkler system installed in accordance with NFPA 13D, with a 2 head maximum calculation, are considered to be sprinklered buildings in accordance with this section. Group R-3 Occupancies greater than or equal to 5000 square feet and Group R-4 Occupancies of any size where protected by a sprinkler system installed in accordance with NFPA 13D, with a 4 head maximum calculation, are considered to be sprinklered buildings in accordance with this section. If a credit for the above-mentioned NFPA 13D system is taken for fire department access increase, no credit may be take for the same system for an increase to hydrant distance.

902.2.3 Increased Distances. When the travel distance from a fire apparatus access road to any point in a building exceeds 300 feet, the building shall be protected throughout by a sprinkler system installed in accordance with NFPA 13 and a Class I Wet-Manual standpipe installed in accordance with NFPA 14.

902.2.4 Multiple Access Roads Required. More than one fire apparatus access road shall be provided when it is determined by the Fire Department that access by a single road might be impaired by vehicle congestion, condition of the terrain, climatic conditions or other factors that could limit access.

902.2.5 Special site considerations. When fire apparatus access roads cannot be installed due to location on property, topography, waterways, nonnegotiable grades or other similar conditions, the Fire Department is authorized to require additional fire protection as specified in Section 1001.9. Where a fire apparatus access road does not serve more than two Group R, Division 3, or Group U Occupancies, the requirements of Sections 902.1 and 902.2 may be modified by the Fire Department.

902.3 Specifications

902.3.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet and a vertical clearance of not less than 14 feet. Fire apparatus access roads established and approved prior to (adoption date) are not required to be widened if maintained and marked in accordance with this section.

EXCEPTION:

1. Public streets and City approved access ways.

902.3.2 Vehicle Passing Points. When fire department access roads exceed 300 feet in length, vehicle passing points shall be installed at intervals not to exceed 300 feet. Vehicle passing points shall be a minimum of 30 feet in width and 50 feet in length. See Figure 9-1.

902.3.3 Loading Areas and Passenger Drop-off Areas. Where areas in fire apparatus access roads are utilized for loading or unloading or are utilized for passenger drop off or pickup, an additional 8 feet of width shall be added to the fire apparatus access road. This width is in addition to the minimum 20 foot access road width.

902.3.4 Surface. Fire apparatus access roads shall be designed to support a minimum imposed live load of 66,000 pounds with a maximum axle load of 24,000 pounds. Fire apparatus access roads shall be provided and maintained with an all-weather driving surface. When a surface other than paving is used for an interior fire apparatus road it shall comply with Section 902.7.

902.3.5 Turning radius. Fire apparatus access roads shall have a minimum 45-foot center line radius (35 foot inside radius, 55 foot outside radius) on curves. See Figure 9-2.

902.3.6 Dead-ends. Dead-end fire apparatus access roads in excess of 200 feet in length shall terminate in an approved turn-around as shown in Figure 9-3.

902.3.7 Bridges. When a bridge is used as part of a required fire apparatus access road, it shall be constructed and maintained in accordance with nationally recognized standards. See Article 90, Standard a.1.1. The bridge shall be designed to support a minimum imposed live load of 66,000 pounds with a maximum axle load of 24,000 pounds.

902.3.8 Grade. The gradient for a fire apparatus access road shall not exceed 15 percent (15 feet in 100 feet). Cross-slope of an access road shall not exceed 3 percent.

902.3.9 Drainage. Water drainage shall be directed away from or piped under the fire apparatus access road. Ponding of water on an access road shall not exceed a depth of 6 inches.

902.3.10 Stabilization. A stabilized edge meeting MAG standards or equivalent is required on fire apparatus access roads to provide stabilization.

902.4 Marking of Fire apparatus access roads. Painted curbs and approved signs or other approved notices shall be provided and maintained for fire apparatus access roads in order to identify such roads and prohibit their obstruction. The marking of fire apparatus access roadways shall be in accordance with Section 902.4.

902.4.1 Curbs. Fire apparatus access roads shall be identified by curbs painted red on both the top and face along the entire length of the fire apparatus access road. Where no curb exists or a rolled curb is installed, a 6-inch wide red stripe applied in two paint applications, the full length of the fire apparatus access road shall be acceptable.

902.4.2 Fire apparatus access road signs. Approved fire apparatus access road signs shall be in accordance with Figures 9-4 and 9-5. The signs shall be posted and installed as follows:

1. Signs shall be attached to an approved stationary pole set in concrete a minimum depth of 18 inches.
2. The bottom of each sign shall be 7 feet above grade.

3. The signs shall face oncoming traffic.
4. A sign shall be installed a maximum of 15 feet from the beginning and end of the fire apparatus access road.
5. Spacing between signs shall not exceed 75 feet. When a fire apparatus access road is 35 feet or less in length, it may be identified with 6 INCH WIDE red striping, a single pole and with signs installed back-to-back on the pole. See Figure 9-6.
6. The signs shall be set back from the curb line or sidewalk a minimum of 12 inches to a maximum of 18 inches.
7. Signs shall be plainly visible at all times. Vegetation or other obstructions shall be located such that a minimum 3-foot clearance is maintained along the line of sight.

902.4.2.1 Signs required on both sides of the fire apparatus access road. When a fire apparatus access road is 28 feet or less in width, signs and red painted curbs are required to be installed on both sides of the access road.

EXCEPTION: Fire apparatus access roads serving only R-3 Occupancies are required to have signs and red painted curbs installed on both sides of the road when 20 feet or less in width.

902.4.2.2 Signs required on one side only of the fire apparatus access road. When a fire apparatus access road is greater than 28 feet and less than or equal to 36 feet in width, signs and red painted curbs are required to be installed on a minimum of one side of the access road.

EXCEPTION: Fire apparatus access roads serving only R-3 Occupancies require signs and red painted curbs on a minimum of one side of the fire apparatus access road when it is greater than 20 feet and less than or equal to 28 feet in width.

902.4.2.3 Signs not required on either side of the fire apparatus access road. When a fire apparatus access road is greater than 36 feet in width, signs or red painted curbs are not required on either side of the fire apparatus access road.

EXCEPTION: Fire apparatus access roads serving only R-3 Occupancies do not require signs and red painted curbs on either side of the fire apparatus access road when it is greater than 28 feet in width.

902.4.3 Stenciling. The Fire Department is authorized to require stenciling or other permanent markings to improve the identification of fire apparatus access roads. When required, the stenciling shall state, "FIRE LANE NO PARKING". Lettering shall be white and shall be a minimum of 3 inches high with ½ inch brush stroke.

902.4.4 Prohibition. No person shall mark a fire apparatus access road without approval of the Fire Department.

902.5 Obstruction and control of fire apparatus access.

902.5.1 General. The required width of a fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances

established under Section 902.3.1 shall be maintained at all times.

Entrances to roads, trails or other fire apparatus access roads that have been closed with gates or barriers in accordance with Section 905 shall not be obstructed.

902.5.2 Stopping or parking in fire apparatus access roads. Motor vehicles, with or without power, including trailers, shall not be stopped or parked in any fire apparatus access road.

Any vehicle stopped or parked within an approved fire apparatus access road may be issued a "Notice of Parking Violation" by any member of the Phoenix Fire Department or Phoenix Police Department, or any representative the fire chief or police chief designates.

Any vehicle stopped or parked within the fire apparatus access road may be removed at the expense of the vehicle owner. Removal of a vehicle under such circumstances may be authorized by the person in lawful possession of the property or by the chief. The person in lawful possession of the property shall keep designated fire apparatus access roads free of vehicles and other obstructions.

See also Phoenix City Code Section 36-133 and 36-134 (4).

902.5.3 Closure of access ways. The Fire Department is authorized to require the installation and maintenance of gates or other approved barricades across roads, trails or other access ways. When required, gates and barricades shall be secured in an approved manner.

EXCEPTION: Public streets, alleys or highways.

902.5.3.1 Use of Closed Access Roads. Roads, trails and other access ways which have been closed and obstructed in the manner prescribed by Section 905 shall not be trespassed upon or used unless authorized by the owner and the chief.

EXCEPTION: Public officers acting within their scope of duty.

Locks, gates, doors, barricades, chains, enclosures, signs, tags or seals which have been installed by the fire department or by its order or under its control shall not be removed, unlocked, destroyed or tampered with in any manner.

EXCEPTION: When authorized by the chief or performed by public officers acting within their scope of duty.

902.5.4 Maintenance of fire apparatus access roads. Fire apparatus access roads shall be maintained by the owner at all times. Faded, damaged or vandalized signs shall be replaced with approved signs and posts.

902.6 Interior fire apparatus access roads. When interior fire apparatus access roads are provided, they shall be installed and maintained in accordance with Section 902.3, 902.5 and Sections 902.6.1 through 902.6.8.

902.6.1 Marking.

902.6.1.1 Interior fire apparatus access roads less than 75 feet in length. The marking of

interior fire apparatus access roads less than 75 feet in length shall be as shown in Figure 9-7.

902.6.1.2 Interior fire apparatus access road greater than or equal to 75 feet in length. An approved fire lane sign shall be mounted on a post installed approximately 15 feet behind the sidewalk or driveway and facing toward the sidewalk or driveway. An approved sign is also required at the termination of the interior fire apparatus road. See Figure 9-8.1 and 9-10.

902.6.1.2.1 Access road greater than 100 feet. For interior fire apparatus access roads greater than 100 feet in length, additional signs shall be located at the midpoint of the road.

902.6.1.2.2 Access road greater than 150 feet. For interior fire apparatus access roads greater than 150 feet in length, additional signs shall be located at 75 foot intervals along the length of the road.

902.6.1.2.3 Security. An approved padlock shall be installed to secure the post on which the fire lane sign is mounted in place and to prevent theft or removal of the post by other than fire personnel. See Figure 9-10.

902.6.2 Sidewalk ramps. When a sidewalk ramp is provided for fire apparatus access, the pavement directly in front of the ramp shall be painted with minimum of 6-inch wide red crosshatch striping no more than 6 feet apart.

902.6.3 Vegetation. Vegetation, trees, bushes or other obstructions shall not be allowed to infringe on the required dimensions of an interior fire apparatus access road.

902.6.4 Closure. Interior fire apparatus access roads shall not be obstructed or used unless authorized by the owner and the Fire Department. See also Section 902.5

902.6.5 Marking of edge of access road. The curb, if installed, shall be painted red or red reflectors shall be installed to define the width of interior fire apparatus access roads. The reflectors shall be imbedded into bordering curbing at intervals not exceeding 15 feet. See Figure 9-8 for marking requirements.

902.6.6 Alternative Surface. When a surface other than paving is used for an interior fire apparatus road it shall comply with Section 902.7.

902.7 Alternative surface fire apparatus access roads. This section applies when the alternative surface fire apparatus access road is not surfaced with traditional road building materials. Alternative surface fire apparatus access roads shall be in accordance with this Section and Sections 902.3.1 through 902.3.10.

902.7.1 Report. Alternative surface fire apparatus access roads shall be designed by an engineer registered in the State of Arizona. The engineer shall prepare a sealed design report for submittal to and approval by the Fire Department. Plans shall be sealed and submitted with the report. See Section 901.3.

902.7.2 Stabilization. Stabilization of the fire apparatus access road surface shall be addressed in the alternative surface fire apparatus access road report and may be accomplished by curbing. See Section 9003, Standard m.1, Standard Details m.1.1, m.1.3, m.1.5, or m.1.11.

902.7.3 Compaction. Minimum 95% compaction of sub-grade soil is required.

902.7.4 Curbs. A rolled curb shall be installed at the entrances to fire apparatus access roads. See Article 90, Standard m.1, Standard Details m.1.2, m.1.4, m.1.6, m.1.7, m.1.8, m.1.9 or m.1.10.

902.7.5 Marking. The curb shall be painted red or red reflectors shall be installed to define the width of alternative surface fire apparatus access roads. The reflectors may be mounted on bollards installed at intervals not exceeding 25 feet or may be imbedded into bordering curbing at intervals not exceeding 15 feet. See Figure 9-8 for marking requirements.

902.7.6 Special inspections. An Arizona registered Professional Engineer shall conduct a special inspection prior to final approvals being issued for the alternative surface fire apparatus access road. See Section 103.1.5.

902.7.6.1 Special inspection documentation. The special inspection documentation shall include, but not be limited to the following:

1. Sub-grade soil compaction report.
2. Base material quality, thickness and compaction.
3. Concrete depth and compressive strength, when applicable.
4. An evaluation of the installation in accordance with design drawings and manufacturer specifications.
5. Crown and drainage requirements.
6. Stabilization (if curbing is not used).

902.7.7 Surface. Fire apparatus access road surface is required to comply with City of Phoenix requirements for roads and parking lots. Aggregate base coarse (ABC) is not permitted as a finished road surface for fire apparatus access roads.

902.8 Temporary Fire Apparatus Access Roads. Temporary fire apparatus access roads, such as those used for fire department access during construction, must comply with Section 902.8.

902.8.1 Required Access. Fire apparatus access is required within 200 feet of all points on the exterior of the building.

902.8.2 Width. Temporary fire apparatus access roads shall be a minimum of 20 feet in width.

902.8.3 Surface. At a minimum, the surface of temporary fire apparatus access roads shall be as follows:

1. Minimum 6 inches of native soil compacted to 95% of standard proctor density (ASTM D698), and

2. Minimum 4 inches of aggregate base compacted to 100% of standard proctor density (ASTM D698).

The surface of temporary fire apparatus access roads may differ from the above requirements if it is shown that the surface provided is sufficient to support an imposed live load of 66,000 pounds with a maximum axle load of 24,000 pounds.

902.8.4 Stabilization. Curbs are not required for temporary fire apparatus access roads.

902.8.5 Turning radius. Fire apparatus access roads shall have a minimum 45-foot center line radius (35 foot inside radius, 55 foot outside radius) on curves. See Figure 9-2.

902.8.6 Dead-ends. Dead-end fire apparatus access roads in excess of 150 feet in length shall terminate in an approved turn-around as shown in Figure 9-3.

902.8.7 Drainage. Water drainage shall be directed away from or piped under the fire apparatus access road. Ponding is not permitted to a depth of more than 3 inches.

SECTION 903 - WATER SUPPLIES AND FIRE HYDRANTS

903.1 General. Water supplies for manual fire suppression and fire hydrants shall be in accordance with Sections 901 and 903. When water is not available from the City of Phoenix, or if the flow rate, pressure, or duration of the water available from the City does not meet the minimum requirements of this code, the owner shall be responsible for installing all of the infrastructure required to meet the fire flow, pressure, and duration requirements of this code.

903.1.1 Design Information Required. Plans, hydraulic calculations, and specifications shall be submitted to the Fire Department for review and approval prior to installation of the water supply system. The fire flow rate shall be calculated in 1000 gpm increments starting at the hydraulically most demanding hydrant while maintaining 20 psi minimum residual pressure in the system up to the minimum flow required by Section 903.2. Underground fire main systems shall be installed in accordance with NFPA 24, *Private Fire Service Mains and Their Appurtenances*. Water tank installations shall be in accordance with NFPA 22, *Water Tanks for Private Fire Protection*.

EXCEPTION: Public water distribution mains approved by the City of Phoenix Water Department.

903.1.2 Water Flow Data. . Water flow test information must be obtained from the City of Phoenix Water Department within 90 days of plan submittal and the original Water Department form shall be submitted.

903.1.3 Water Supply Pressure Adjustments. To account for seasonal and daily fluctuations in the water supply system, the following adjustments to the water pressure shall be applied to all water tests performed for hydraulic design of water supply systems.

903.1.3.1 Static Pressure over 88psi. When the static pressure is over 88 pounds per square inch (psi), the maximum design static pressure will be 80 psi regardless of the actual test pressure. The slope of the original design curve shall be used even though the design pressure is reduced to 80 psi.

903.1.3.2 Static Pressure less than or equal to 88psi. When the recorded static pressure is less than or equal to 88 psi, the design static pressure shall be reduced by 10 percent. The slope of the original supply curve shall be used.

903.1.4 Failure to Provide Water Supply. Failure to provide the required water supply necessary for fire protection shall be considered a hazard to life or property and is subject to enforcement under Section 103.4 of this code.

903.2 Required Water Supply for Fire Protection. The fire flow for private fire mains shall be calculated based on Sections 903.2.1 or 903.2.2 whichever is less. In no case shall the required fire flow be less than 1,000 gpm for a single family dwelling and no less than 1,500 gpm for all other buildings.

903.2.1 Fire Flow Requirements Using Appendix III-A. A 50% reduction of the fire flow amount determined by using Appendix III-A is allowed when the building is protected by a sprinkler system installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*.

903.2.2 Fire Flow Requirements Using City of Phoenix Design Standards Manual for Water Systems. The minimum design standards found in the COP Design Standards Manual for Water Systems are as follows:

1. Single-family dwellings - 1,000 gpm.
2. Multiple-family dwellings - 1,500 gpm.
3. Commercial - 3,000 gpm.
4. Industrial, warehouse, and all downtown areas - 5,000 gpm.

903.2.3 Storage of Combustibles or Hazardous Materials. Additional fire flow for manual fire protection, as determined by engineering analysis and approved by the Fire Department, shall be provided when necessary at all facilities used for the storage of combustible or hazardous materials in quantities that exceed the outdoor exempt amounts (see Articles 79 and 80 for these quantities).

903.2.2 Temporary Fire Flow. A temporary water supply for use during construction is allowed only by appeal to the Fire Marshal. When constructing one and two-family houses, the installation of a temporary water supply shall be adequate only for construction of the model homes (as designated by DSD) with an approved appeal. For documentation purposes, the following is required for appeals regarding temporary fire flow:

1. A report, stamped by a professional engineer, shall be provided. This report is required to contain both plans of the system and hydraulic calculations. Minimum 1500 gpm at 20 psi will be required for systems in single family home developments. Minimum 2500 gpm at 20 psi will be required at all other types of occupancies. Table A-III-A may be used in lieu of these requirements. Spacing of hydrants shall be in accordance with Section 903.4.3.
2. A permit shall be obtained from the fire department before installation of the temporary water supply is commenced.
3. An inspection and test of the system will be required.

903.3 Type of Water Supply. Water supply is allowed to consist of reservoirs, pressure tanks, elevated tanks, pumps, water mains or other fixed systems capable of providing the required

fire flow. Components of such installations are required to be listed or approved for the intended use and installed in accordance with the appropriate nationally recognized standard.

903.3.1 Fire Mains. Fire mains are required to be sized to accommodate the calculated fire flow but shall not be less than the following:

1. Where water mains are used to provide the required fire flow the minimum diameter of a dead-end fire main shall be 8 inches,
2. The minimum diameter of a looped fire main shall be 6 inches. When a looped fire main is provided, the main is required to be tied into an approved city water main in at least two places not less than 200 feet apart.

903.4 Fire Hydrant Systems

903.4.1 General. Fire hydrant systems and fire hydrants shall be in accordance with Section 903.4. When city water mains and fire hydrants do not provide the minimum required fire flow, approved fire mains and fire hydrants shall be installed on private or public property. The installation of fire mains and fire hydrants in the public right-of-way shall also meet the Phoenix Water and Wastewater Department specifications.

903.4.2 Use, Testing and Maintenance. Fire hydrant systems shall be subject to such periodic tests as required by NFPA 25. Fire hydrant systems shall be maintained in an operative condition at all times and shall be repaired where defective. Additions, repairs, alterations and servicing shall be in accordance with approved standards. See also Sections 1001.5 and 1001.6.2.

903.4.3 Hydrant Locations. Fire hydrants shall be placed in locations approved by the Fire Department and as described in Section 903.4.5.

903.4.3.1 Distance to Building or Facility. The distance from a hydrant to the most remote exterior point of the building or facility shall not exceed that specified in this section. The required distance shall be measured along the path of the fire apparatus access road. Hydrants located across the road from the building or facility may not be considered to comply with this requirement if there is a median in the road.

903.4.3.1.1 Non-Sprinklered Buildings.

903.4.3.1.1.1 Facilities and Non-Sprinklered Buildings other than Group R-3 Occupancies. At least one fire hydrant shall be located within 350 feet of the most remote exterior point of the building or facility. Additional hydrants may be required to meet minimum fire flow as required by Section 903.2.

903.4.3.1.1.2 Non-Sprinklered Group R-3 Occupancies. At least one fire hydrant shall be located within 350 feet of the furthest point of fire apparatus access.

903.4.3.1.2 Sprinklered Buildings.

903.4.3.1.2.1 All occupancies other than Group R-3. For buildings protected by a sprinkler system installed in accordance with NFPA 13, at least one fire hydrant shall be located within 500 feet of the most remote exterior point of the building.

903.4.3.1.2.2 Group R-3 Occupancies. For Group R-3 buildings protected by a sprinkler system installed in accordance with NFPA 13D, at least one fire hydrant shall be located within 500 feet of the most remote exterior point of the building.

903.4.3.1.3 Parking Areas. In open-air, on-grade parking areas at least one fire hydrant shall be located within 600 feet of all areas.

903.4.3.2 Distance to Fire Department Connections (FDC). At least one fire hydrant shall be located a maximum of 200 feet from a fire department connection. The distance between the hydrant and FDC shall be measured along the path of the fire apparatus access road.

903.4.3.3 Hydrant Spacing. Fire hydrants shall be spaced approximately 500 feet apart in single-family residential developments and shall be approximately 300 feet apart in all other development types. The distance between hydrants shall be measured along the path of the fire apparatus access road.

903.4.4 Hydrant Specifications.

903.4.4.1 Phoenix threads. Fire hydrants shall be provided with Phoenix threads. See Figure R1003-B for Phoenix threads specifications.

903.4.4.2 Height. Fire hydrants shall be installed so that the centerline of the lowest outlet is not less than 18 inches above grade and the highest outlet does not exceed 30 inches above grade.

903.4.4.3 Color of hydrants. The color of hydrants shall be fire hydrant yellow. Private fire hydrants shall have the bonnet painted reflective white. Hydrants not intended for fire department use shall have the bonnet painted black.

903.4.4.4 Protection of hydrants. Fire hydrants subject to possible vehicular damage shall be adequately protected with guard posts in accordance with Section 8001.11.3. Hydrants shall be protected by a minimum of two bollards placed 4 feet on center. When vulnerable from more than one directions additional guard posts shall be provided.

903.4.4.5 Clearance Around Hydrants. A minimum clearance of 4 feet, measured from the center stem, is required around all hydrants, except bollards placed around the hydrant at 4 foot on center for hydrant protection. No vegetation, decorations, walls, or similar are permitted in this clear space that would impede the use of the hydrant. See Figure 9-12. See also Section 903.4.3.

903.4.4.6 Tampering and Obstructions. Vehicle parking shall be prohibited within 15 feet in front of and in both directions parallel to the curb line in front of the fire hydrant. For hydrants that are set back from the curb, the 15 foot clearance shall be measured from the curb line. Vehicles parked in violation shall be issued a Notice of Parking Violation. See Figure 9-11. See also Sections 1001.6 and 1001.7.

903.4.4.7 Accessibility. Fire hydrants shall be accessible to the fire department apparatus by roads meeting the requirements of Section 902. Fire hydrants shall be located not less than 1 foot and not more than 6 feet from the back of the curb of the access road or other vehicle access point. The largest outlet on the hydrant shall face the fire apparatus access road.

SECTION 904 PREMISE IDENTIFICATION

904.1 Addresses. Approved address numbers shall be provided for all new and existing buildings in such a manner as to be plainly visible and legible from the street or road fronting the property.

904.1.1 Single family homes. The address numbers for single family homes shall be a minimum of 4" high, with a MINIMUM $\frac{3}{4}$ " wide brush stroke on a contrasting background

904.1.2 Multi family communities. The street address numbers for multi family communities shall be a minimum of 12 inches high with a minimum 2 inch wide brush stroke on contrasting color. For buildings less than 100 feet long, a minimum of one address shall be provided. For buildings over 100 feet in length, the address is required in a minimum of two places. Each building in a complex shall display its own identification.

904.1.2.1 Building Identification Numbers. Each building shall display its specific alphabetical or numerical designation which must be clearly distinguishable from the fire apparatus access road. The building identification numbers shall be a minimum of 18 inches high with a minimum 3 inch brush stroke on contrasting color. For buildings less than 100 feet long, a minimum of one building identification number per building shall be provided. For buildings over 100 feet in length, building identification numbers are required in a minimum of two places. The building identification number is required to be internally or externally illuminated.

904.1.2.2 Spread Numbers. Spread numbers shall be provided adjacent to the building identification numbers to indicate the apartment numbers and the number of floors in the building. Apartment spread numbers shall be a minimum of 7 inches high with a 1 inch brush stroke on a contrasting background. The spread numbers are required to be internally or externally illuminated.

904.1.2.3 Unit Identification at entrances. Where only two units are accessed from an entrance, a corridor unit plate is required. See Figure 9-13 for corridor unit sign specifications. Where more than 2 units are accessed for an entrance, a corridor spread plate is required. See Figure 9-14 for corridor spread sign specifications.

904.1.2.4 Apartment or Unit Numbers. Individual apartment or unit numbers shall be a minimum 4 inch high with a minimum $\frac{3}{4}$ inch brush stroke on a contrasting background.

904.1.2.5 Additional Unit Identification signs. Where a building is not visible from the fire apparatus access road, a directional sign indicating the location of the units is required. See Figure 9-15 for sign specifications.

904.1.3 Commercial/industrial buildings. Building address numbers shall be a minimum of 12 inches high with a minimum 2-inch brush stroke on contrasting background. The address shall be visible from all access directions. When buildings are more than 200 feet long or set back from the road more than 100 feet they shall be identified with building address numbers that are a minimum 24 inches high with a 4 inch brush stroke of a contrasting color.

When buildings are greater than 500 feet in length the number and address shall be provided in a minimum of 2 locations. When buildings have multiple access points, numbers and

addresses shall be provided at each access point.

904.1.3.1 Multi-tenant Complexes. Individual tenant spaces in multi-tenant complexes shall have their address or suite number posted at the front entrance and rear access doors. This number shall be a minimum 6" x 1" brush stroke on a contrasting background.

904.1.3.2 Multiple buildings at a single address. Each building must also display its specific alphabetical or numerical designation which must be clearly distinguishable from the fire apparatus access road. See 904.1.3 for letter height and brush stroke requirements.

904.1.4 Marquee and Monument. When addresses are provided on a marquee or monument located next to the street, the address numbers shall be a minimum 12" high with a 2" brush stroke. The numbers shall be located a minimum of 3 feet above grade. Numbers shall contrast with the background.

904.1.5 Address directories.

904.1.5.1 When required. An approved address directory shall be provided at properties containing one of the following:

1. More than one principal building,
2. Buildings with unit identification numbers which are randomly numbered or sequenced,
3. Or when, in the opinion of the fire department, emergency response may be delayed due to the physical layout of the complex.

Prior to construction, plans shall be submitted to the Fire Department for approval.

904.1.5.2 Specifications. Address directories shall be constructed and installed in accordance with this section.

904.1.5.2.1 Dimensions. The number of buildings in the complex shall determine the minimum dimensions of the directory. Minimum directory dimensions shall be as follows:

1. Complexes containing 12 or fewer buildings requires a minimum 3 feet by 3 feet (9 square feet) site directory.
2. Complexes containing 13 to 30 buildings requires a minimum 4 feet by 4 feet (16 square feet) site directory.
3. Complexes containing 31 or more buildings requires a minimum 5 feet by 5 feet (25 square feet) site directory.

Stanchions or supports shall not be included in the required size of the directory.

904.1.5.2.3 Framing. Framing materials shall not encroach upon the directory face by more than 1½ inches.

904.1.5.2.4 Protection. The directory shall be protected against vandalism and disfigurement by a clear polycarbonate cover, having a minimum thickness of 1/8-inch, sealed to protect the directory from weather.

904.1.5.2.5 Illumination. Address directories shall be internally illuminated utilizing white light.

904.1.5.2.6 Installation requirements. Support posts or stanchions shall be set in concrete. Directories with dimensions of 3 feet by 3 feet (9 square feet) shall be mounted with the bottom of the directory not less than 36 inches above grade. Directories with dimensions of 4 feet by 4 feet (16 square feet) and 5 feet by 5 feet (25 square feet) shall be mounted with the bottom of the directory not less than 24 inches above grade.

904.1.5.2.7 Depictions. All depictions must be clear, easily understood, and legible at a distance of 8 feet. The directory shall depict structures, building numbers, units, apartment or space numbers, tennis courts, swimming pools, elevators, driveways, streets, laundry rooms, fire hydrants, fire apparatus access roads and other features as determined by the Fire Department. The depictions shall comply with the following:

1. Directories shall be a dark print on a contrasting light background. Buildings shown on the directory shall not be the same color as other features indicated on the directory.
2. The name and address of the complex are required and shall not exceed 10% of the total size of the site directory.
3. Swimming pools, canals, and waterway areas shall be translucent blue.
4. Tennis courts shall be translucent green.
5. Fire hydrants shall be a 1/4" inch diameter black circle filled in with a translucent yellow center. The abbreviation "HYD" must be affixed by the location of the hydrant on the directory.
6. The directory shall be properly oriented to the viewer with a red dot, 1 inch in diameter, with the words "you are here" affixed at the appropriate location on the directory.
7. A north arrow shall be included in the upper right quadrant of the directory. The arrow shall be a minimum of 3 inches in length and a minimum of 1 inch brush stroke.
8. Interior fire apparatus access roads, where provided, shall be marked on the directory with red crosshatching.

904.1.5.2.8 Setbacks. The directory shall be installed on the occupancy's property, at locations approved by the Fire Department. Placement of the address directory shall be as follows:

1. The directory shall be set back from the street or curbing at least 25 feet to allow emergency vehicles to clear the public right-of-way.
2. Shall not exceed a distance of 4 feet from the edge of the fire apparatus access road facing the direction of oncoming traffic.
3. Shall not conflict with traffic visibility zones as provided for by other ordinances.

4. Shall be immediately visible and free from obstructions including architectural design and landscaping.

904.1.5.2.9 Prohibitions. Information such as advertising or additional artwork shall not be allowed on the address directory.

904.1.6 Maintenance. All premise identification shall maintained clearly visible and free from obstructions, including landscaping.

SECTION 905 FIRE APPARATUS ACCESS GATES

905.1 General. Fire apparatus access gates shall be in accordance with this section. Permits are required to install or modify fire apparatus access gates and auxiliary access openings and shall be obtained from the Fire Department and the Development Services Department.

905.1.1 Gate Installation Companies. When gates are installed at any location that obstructs a fire apparatus access road, the installing company shall be licensed by the Arizona Registrar of Contractors as L-5 or C-5.

905.1.2 Egress. Fire apparatus access gates shall be designed and installed such that they do not obstruct the egress or departure of emergency vehicles.

905.1.3 Maintenance. All fire apparatus access gates shall be maintained operable at all times and shall be inspected at least annually. Copies of the annual inspection report shall be maintained and be accessible for Fire Department review.

905.1.4 Inoperable Gates. Fire apparatus access gates shall be chained open or removed at the owner's expense if not maintained in an operable condition.

905.1.5 Illegal Gates. Fire apparatus access gates installed without a permit shall be chained open or removed at the owner's or installing contractor's expense until a permit and final approval have been obtained from the fire department.

905.1.6 Opening width. When fully opened, a minimum 20-foot clear width shall be provided for both the entrance and exit gates. Gates installed and approved prior to (date) shall be maintained in accordance with the original approval.

The chief shall require additional width opening when a 45-foot fire apparatus turning radius cannot be met.

905.1.7 Auxiliary Access Openings.

905.1.7.1 General. Auxiliary access openings are required to be automatic where no turn-around is provided for fire apparatus. See Figure 9-3 for approved turnarounds.

905.1.7.2 Main entrance identification. Auxiliary access openings shall have signs that identify the location of the property's primary entrance, and signs shall be bolted on the street side of the fire apparatus access gate. See Figure 9-16.

905.1.7.3 Marking and Signage. Manual and automatic auxiliary access openings are

required to be marked in accordance with Section 905.3.4. Signage shall be provided in accordance with Section 905.3.3.

905.2 Automatic fire apparatus access gates.

905.2.1 General. Automatic fire apparatus access gates shall be in accordance with this Section and Section 905.1.

905.2.2 Standby Power systems. In the event of a power failure, automatic fire apparatus access gates shall be provided with a standby power system. Standby power is permitted to be, but not limited to, battery back-up or connection to an emergency generator. The activation of the system shall open the gates and maintain them in the open position until primary power is restored to the system. Standby power systems are required to comply with Electrical Code Article 701.

EXCEPTION: Fire apparatus access gates installed at occupancies other than multifamily residential properties may remain closed until the emergency gate switch is activated, and shall then remain open while the standby power system is operating the gate.

905.2.3 Opening time. Activated fire apparatus access gates shall open at a minimum rate of one foot per second.

905.2.4 Emergency key switch. Each fire apparatus access gate shall be equipped with an approved key switch on both sides of the gate. Key switches installed on the property side of the gate shall be adjacent to the property gate. When separate entry and exit gates are provided, the emergency key switch shall open the entrance and exit gates.

905.2.5 Key switch requirements.

905.2.5.1 Key switch identification. An approved sign reading "F.D. ACCESS" shall be installed within 12 inches of the emergency key switch. See Figure 9-17 for required sign plate specifications.

905.2.5.2 Height. The key switch shall be mounted no higher than 5 ½ feet above grade.

905.2.5.3 Visibility. The key switch shall be illuminated so as to be immediately visible to fire personnel from the emergency apparatus.

905.2.5.4 Obstruction and impairment. Posts, fences, vehicles, growth, trash storage and other materials shall not be placed or kept near key switches in a manner that would prevent the key switches from being immediately discernible.

905.2.6 Bypass of systems. When activated, the emergency key switch shall bypass all occupant and loop switch systems.

905.2.7 Preemption Devices. Preemption devices are required on all new automatic fire access gates installed after January 1, 2001 at residential properties. Gates installed without permits or proof of installation date require preemption devices. Voluntary installations of preemption devices shall comply with the requirements of Section 905.2.7.

905.2.7.1 Locations. The devices shall be installed such that the gate will open for both

ingress and egress of emergency vehicles.

905.2.7.2 Minimum Installation Standards. The installation of preemption devices shall comply with the following:

1. Detectors shall be mounted 8 to 10 feet above grade.
2. Detectors shall be located a minimum of 18 inches behind the gate on the property side.
3. Detectors shall be mounted on a separate 4 inch by 4 inch metal post and not on the guidepost. The metal post shall be cemented a minimum of 18 inches below grade.
4. Detectors shall activate at a minimum of 150 feet from the gate.
5. Detectors shall point toward both the approach and the exit path of the emergency vehicle.
6. The sight path of the detector shall be free of visual obstructions such as signs, covered parking, canopies and vegetation.
7. Individual detectors shall be mounted together with the power module in a dual detector-mounting box. Detectors shall be approved by the fire department. A list of approved devices will be maintained by the fire department and available to the public.

905.3 Manual Fire Apparatus Access Gates.

905.3.1 General. Manual fire apparatus access gates shall be in accordance with this section and section 905.1.

905.3.2 Locking mechanism. All manual fire apparatus access gates shall use an approved dual padlock mechanism. See Figure 9-18.1 and 9-18.2 for required locking mechanism specifications. Gates installed and approved prior to (date) shall be maintained in accordance with the original approval.

905.3.3 Signs. Approved fire apparatus access road signs shall be provided on the manual gates. The signs shall have a reflective background and shall be bolted back to back onto each side of the gate. See Figures 9-4, 9-16, 9-17, 9-18.1 and 9-18.2.

905.3.4 Marking. Minimum six-inch wide red, crosshatched striping shall be painted on the ground surface on both sides of the manual access gate, including recessed areas as determined by the Fire Department. A minimum of two applications of paint is required. See Figure 9-18.1.

906 OTHER FIRE DEPARTMENT ACCESS

906.1 Access to Building Openings.

906.1.1 Required access. Exterior doors and openings required by this code or the Building Code shall be maintained readily accessible for emergency access by the fire department. An approved firefighter access walkway leading from fire apparatus access roads to exterior openings required by this code or the Building Code shall be provided.

906.1.1.1 Firefighter access walkway. Continuous, unobstructed and undiminished paths for access to the building shall be provided. Such paths shall not be developed or otherwise altered in their capacity to provide access to the building and shall be free of barriers including, but not limited to, fences, water retention areas, and barricades.

906.1.2 Maintenance of exterior doors and openings. Exterior doors or their function shall not be eliminated without prior approval by the Fire Department. Exterior doors which have been rendered nonfunctional and which retain a functional door exterior appearance shall have a sign affixed to the exterior side of such door stating THIS DOOR BLOCKED. Required fire department access doors shall not be obstructed or eliminated. See Section 1207 for exit and exit-access doors. For access doors for high-piled combustible storage, see Section 8102.6.2.

906.1.2.1 Blocked Door Sign Construction. The sign plate shall be a minimum thickness of .080 aluminum construction. The sign face shall have a red reflective background using 3M Scotchlite® or equivalent sign face.

906.1.2.2 Blocked Door Sign Lettering. White screen printed lettering is required. The sign shall consist of letters having a brush stroke of not less than 3/4 inch wide and at least 6 inches high on a contrasting background.

906.1.3 Shaftway marking. Exterior windows in buildings used for manufacturing or for storage purposes which open directly on shaftways or other vertical means of communication between two or more floors shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches high on a white background. Warning signs shall be easily discernible from the outside of the building. Door and window openings on such shaftways from the interior of the building shall be similarly marked with the word SHAFTWAY in a manner which is easily visible to anyone approaching the shaftway from the interior of the building, unless the construction of the partition surrounding the shaftway is of such distinctive nature as to make its purpose evident at a glance.

906.1.4 Exterior Doors Without Landings. Exterior doors without landings shall be marked with the words "Danger – No Exit".

906.1.4 Key Boxes. When a building, other than a Group R-3 Occupancy, is monitored off-site for security, fire, or other service that notifies the fire department, a key box shall be installed in an accessible location. The key box shall be of an approved type and shall contain keys to gain necessary access as required by the Fire Department.

906.1.4.1 Height. The key box shall be mounted no higher than 5 ½ feet above grade.

906.1.4.2 Visibility. The key box shall be illuminated so as to be immediately visible to fire personnel from the emergency apparatus. Posts, fences, vehicles, growth, trash storage and other materials shall not be placed or kept near key boxes in a manner that would prevent the key boxes from being immediately discernible.

906.1.4.3 Marking of keys for fire department access. Each key shall be color-coded, to identify its function, as follows:

1. Green for access gates.
2. Yellow for elevators.
3. Red for the Fire Control Room.
4. Blue for keys related to water access (i.e., gates to swimming pools).
5. White for master keys.

Keys that are required to access secured areas for a function not listed above, shall be provided with water-resistant tags. The tags shall be marked in a contrasting color with the key's function and room number. The terminology used to mark the tags shall provide immediate understanding as to the key function.

906.2. Pedestrian gates. Required pedestrian gates shall be in accordance with the following:

1. The minimum width of the gate opening shall be 4 feet.
2. For the purposes of exiting the property, the gate shall be openable from the inside without the use of a key or special knowledge.
3. For the purposes of accessing a property, when a key or special knowledge is required to unlock the gate, an approved key box containing the means to unlock the gate shall be provided on the street side of the gate.